

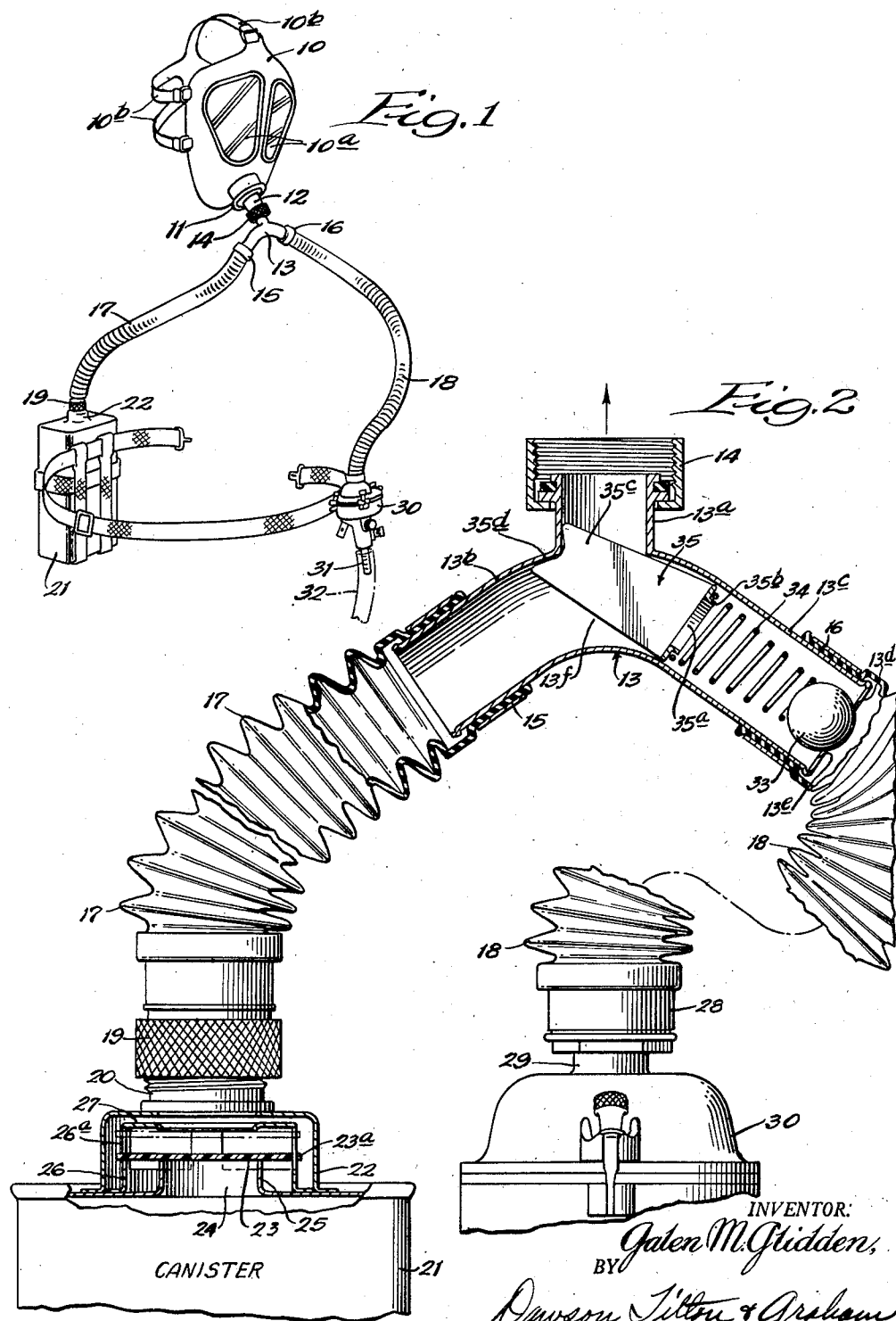
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TRANSFER MASK

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TRANSFER MASK

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This invention relates to a transfer mask, that is, it relates to a mask which is particularly adapted for transferring from one compressed air supply to another while providing the wearer with another source of air during the transition interval. The transfer mask of this invention also has other applications and uses, such as providing protection against failure of a compressed air supply, etc.

The wearer of a compressed air mask is somewhat confined in his movements, since the mask must be connected to a compressed air supply. This has proven to be a rather serious limitation in the industrial use of compressed air masks, since workers very frequently wish to move about within the contaminated areas of the plant over rather large rooms and even from room to room. While the mask can be readily disconnected from a compressed air supply and reconnected to another source of compressed air at a different point, it has been necessary for the wearer to hold his breath during the transfer interval, which is not only uncomfortable to the wearer but seriously limits the distance of movement between sources of compressed air. Further, there is also the problem of having a failure in the supply of compressed air, which leaves the worker without any source of air for breathing.

It is therefore a general object of this invention to provide a mask which substantially overcomes the problems and difficulties set out above. More specifically, it is an object of this invention to provide a mask which is adapted for transferring from one source of compressed air to another, and it is therefore referred to herein as a transfer mask. Still another object is to provide a transfer mask of the character described which provides an auxiliary air supply for use during the transfer interval when the mask is not connected to a compressed air supply. In this connection, it is a specific object to provide a means for automatically connecting the mask to the auxiliary source of air whenever it is disconnected from the source of compressed air. A still further object is to provide a mask which as a safety feature is provided with means supplying atmospheric air whenever the supply of compressed air is terminated, whether by a failure in the compressed air supply or by disconnecting the mask from the source of compressed air. Further objects and advantages will appear as the specification proceeds.

This invention is shown in an illustrative embodiment in the accompanying drawing, in which—

Fig. 1 is a perspective view of a transfer mask embodying the present invention, and Fig. 2 is a front elevational view of part of the equipment shown in Fig. 1, illustrating the details of construction by partial sectional view where such details are important for the purposes of this invention.

The transfer mask illustrated in the drawing includes a face piece 10 with the usual eye pieces 10a and head straps 10b. Face piece 10 is also provided with a valve-controlled outlet at 11, the outlet being concentric to the inlet at 12. This particular concentric arrangement of the inlet and outlet, however, forms no part of the present

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invention and is not essential to the objects of this invention.

In accordance with this invention, a conduit means is provided extending from the gas mask inlet and dividing into two branches. In the embodiment shown in the drawing, the leg 13a of a Y connector 13 is coupled to an extension of inlet 12 by means of a coupling nut 14. To each of the arms 13b and 13c of Y connector 13 there is clamped respectively at 15 and 16 a flexible conduit or corrugated hose 17 and 18.

One of the branches of the conduit extending from face piece 10 is connected to a canister of the type employed for supplying decontaminated atmospheric air to a gas mask face piece, while the other branch of the conduit is connected to a source of compressed air. In the illustration given, the lower end of hose 17 is equipped with an attachment nut 19 dimensioned to be received on the externally threaded outlet nipple 20 of a gas mask canister 21. Obviously, other standard connections can be used with equal facility. The conduit branch provided by hose 17 together with canister 21 provide a passage for the intake of atmospheric air.

In accordance with this invention a flutter-type outlet check valve is interposed in the atmospheric air intake passage constructed and arranged so that a slight negative pressure within the face piece will open the valve and permit air to flow inwardly through the intake passage. This can be readily accomplished as in the illustration given, where the canister 21 is provided at its top with a head 22 having a disc 23 therein acting as a flutter-type outlet check valve. Specifically, as shown in Fig. 2, disc 23 closes the passage 24 from canister 21 by seating on the top of outlet neck 25 and lifting above the top of neck 25 to open the passage into hose 17. A slotted shell 26 is also provided about disc 23 for guiding its upward and downward movements, projections 23a on disc 23 extending into slots 26a of shell 26. At its top shell 26 provides an inwardly extending flange 27 to limit the upward movement of disc 23. Other flutter valve assemblies for gas mask canisters can be employed, as is well known in the art.

The other branch of the conduit provided by Y connector arm 13c and hose 18 is adapted to be connected to a source of compressed air. As shown in the drawing, the lower end of hose 18 is secured to the outlet nipple 29 of a cartridge-type air filter 30 by means of a releasable clamp 28. As shown more clearly in Fig. 1, a plug-type hose connector 31 extends from the inlet end of filter unit 30 and is adapted to be inserted in the end of a compressed air supply hose 32 while being readily disengageable therefrom. Air filter unit 30 can be omitted, if desired.

Within the compressed air intake passage there is interposed, in accordance with this invention, a spring-biased outlet check valve which is constructed and arranged so that it will be opened by a positive pressure in the compressed air intake passage downstream from the spring-biased valve. While this spring-biased valve can be located anywhere in the compressed air intake passage, it has been found to be advantageous to place it in arm 13c of Y connector 13, as illustrated more clearly in Fig. 2.

In the illustration given, the lower end of arm 13c is provided with an inwardly extending flange 13d providing an annular valve seat 13e. A ball valve 33 within leg 13a is dimensioned and arranged to rest on seat 13e and thereby close the compressed air intake passage while being movable away from the valve seat to open the passage. A compression spring 34 is also provided within arm 13c with its lower end bearing against ball valve 33 and urging it onto seat 13e. Preferably, compression spring 34, as illustrated, extends toward the throat 13f of Y connector 13, and a removable clip 35 is seated in throat 13f and

arranged to maintain spring 34 under compression. In the illustration given, clip 35 is U-shaped. At the bottom of the U between the legs thereof there is provided an opening 35a above the upper end of spring 34. The bottom of U-shaped clip 35 is also provided with a downwardly extending lip 35b providing a seat for the upper end of spring 34. The legs 35c of clip 35 are notched at 35d to engage the wall corner between leg 13a and arm 13b of Y connector 13. With this construction clip 35, spring 34 and ball valve 33 can be easily inserted and removed from Y connector 13.

Operation

In the normal operation of a transfer mask constructed in accordance with this invention, the wearer will be receiving air from a source of compressed air, and only in emergencies or during an interval of time in which the wearer is moving from one source of compressed air to another will atmospheric air be supplied to the mask. It is an important feature of the mask, however, that the atmospheric air will automatically become available whenever the compressed air supply fails or the mask is disconnected therefrom. This can be made clearer by considering the following discussion of the embodiment illustrated in the drawing.

Compressed air is supplied through hose 32. It will pass through the cartridge filter within filter unit 30, and thence into hose 18, thereby exerting a positive pressure against ball valve 33 sufficient to unseat the ball valve and permit the compressed air to flow continuously into and through face piece 10. Usually a positive pressure of .6 to .8 inch of water will be maintained within the face piece, and the compressed air will be supplied at a corresponding higher pressure, allowing for slight pressure losses in the supply conduit. It will be understood, of course, that compression spring 34 should be a rather light spring which can be readily compressed by a small positive pressure.

When the compressed air is being supplied as already described, not only will there be a positive pressure within the face piece but this pressure will extend into hose 17 down to the flutter valve within the atmospheric air intake passage. Specifically, the positive pressure within hose 17 will force disc 23 downwardly against the top of neck 25, thus closing the atmospheric air intake passage. As long as a positive pressure is maintained above disc 23 or other flutter-type outlet check valve, the valve will remain closed, and this condition will prevail as long as compressed air continues to be supplied to the face piece.

However, when compressed air is no longer supplied to the compressed air intake passage, ball valve 33 will automatically close, since it is spring biased to a closed position by compression spring 34. When this occurs, the continued inhalation of air by the wearer of the mask will create a slight negative pressure within the face piece which will extend down to the flutter valve within the atmospheric intake passage and cause this valve to automatically open. More specifically, a slight negative pressure thus created above disc 23 will cause this disc 23 to rise and open the outlet passage 24 from canister 21. Thus, atmospheric air will be admitted to the face piece through the atmospheric air intake passage, after being decontaminated by flowing through canister 21. This will permit the wearer to continue breathing normally until the mask is again supplied with compressed air, at which time ball valve 33 will automatically open and disc valve 23 will automatically be closed.

While in the foregoing specification this invention has been described in relation to a specific embodiment thereof and many details have been set forth for purpose of illustration, it will be apparent to those skilled in the art that this invention is susceptible to other embodiments

and that many of the details set forth herein can be varied widely without departing from the basic concepts of the invention.

I claim:

1. A transfer mask, comprising a face piece having a valve-controlled outlet and an inlet, a canister for use with said face piece, a Y connector having its leg connected to said face piece inlet, a separate hose section connected to each of the arms of said Y connector, the lower end of one of said hoses being adapted for connection to a source of compressed air and the lower end of the other of said hoses communicating with said canister, said canister having a check valve associated therewith, and a spring-biased outlet check valve positioned within the arm of said Y connector which is connected to said compressed air hose section, said spring-bias valve including an inwardly extending flange associated with the arm of said Y connector providing a portion of the compressed air intake passage, said inwardly extending flange providing a valve seat, valve means within said connector leg dimensioned and arranged to rest on said valve seat and close the compressed air intake passage, and spring means arranged to urge said valve seat against said seat and extending within said arm toward the throat of said Y connector.

2. A transfer mask, comprising a face piece having a valve-controlled outlet and an inlet, a canister for use with said face piece, a Y connector having its leg connected to said face piece inlet, a separate hose section connected to each of the arms of said Y connector, the lower end of one of said hoses being adapted for connection to a source of compressed air and the lower end of the other of said hoses communicating with said canister, said canister having a check valve associated therewith, and a spring-biased outlet check valve positioned within the arm of said Y connector which provides a portion of the compressed air intake passage, said spring-biased valve including an inwardly extending flange associated with the said arm of said Y connector, said inwardly extending flange providing an annular valve seat, a ball within said connector arm dimensioned and arranged to rest on said valve seat and close the compressed air intake passage, a compression spring arranged to urge said ball against said seat and extending within said arm toward the throat of said Y connector, and a removable clip within the throat of said Y connector arranged to maintain said spring under compression.

3. A device for converting an ordinary gas mask to a transfer mask, comprising a Y connector having a leg adapted to be connected to the inlet of a gas mask face piece, said connector also providing two arms adapted to be connected respectively to a compressed air supply hose and to an atmospheric air supply hose, a spring-biased outlet check valve positioned within the arm of said Y connector which is adapted for connection to said compressed air supply hose, said spring-biased valve including an inwardly extending flange associated with the arm of said Y connector within which said check valve is positioned, said inwardly extending flange providing an annular valve seat, a ball within said last-mentioned connector arm dimensioned and arranged to rest on said valve seat and close the said last-mentioned arm, a compression spring arranged to urge said ball against said seat and extending within said last-mentioned arm toward the throat of said Y connector, and a removable clip within the throat of said Y connector arranged to maintain said spring under compression.

References Cited in the file of this patent

UNITED STATES PATENTS

492,980	Coquy	Mar. 7, 1893
2,085,249	Bullard	June 29, 1937